

- Griffiths, J. 1968. Multi-modal frequency distributions in bird populations. *Bird Study* 15: 29–32.
- Hilty, S. L. & Brown, W. L. 1986. *A Guide to the Birds of Colombia*. Princeton University Press.
- King, J. R. 1989. Notes on the birds of the Rio Mazan Valley, Azuay Province, Ecuador, with special reference to *Leptosittaca branickii*, *Hapalopsittaca amazonina pyrrhops* and *Metallura baroni*. *Bull. Brit. Orn. Cl.* 109: 140–147.

Address: J. R. King, Haresgrove Cottage, Hydon Heath, Godalming, Surrey GU8 4BB, U.K.

© British Ornithologists' Club 1990

Notes on the Giant Hummingbird *Patagona gigas* in southern Ecuador

by J. R. King & S. J. Holloway

Received 7 September 1989

King (1989) reports on the findings of an avifaunal survey of the Rio Mazan Valley, Azuay Province, Southern Ecuador ($2^{\circ}52'S$, $79^{\circ}7'W$) undertaken in July–September 1986 and July–October 1987. These findings included the most southerly known records of the Giant Hummingbird *Patagona gigas* in Ecuador, and the following notes expand upon these records and include new ecological information for the species.

The only previous record of *P. gigas* from southern Ecuador is that of Ortiz-Crespo (1974), who reported one found dead near Cuenca (15 km due E of Mazan) on 20 October 1968 (believed killed some 2 weeks earlier) and who understood the species to be "not uncommon in the dry hills in this area". The species is also referred to by Ministerio de Agricultura y Ganadería (1986), whose workers apparently recorded *P. gigas* on the paramo above the Llaviuco Valley (immediately north of Mazan—see King 1989), probably in the austral summer 1985/86, but no details are available.

We recorded several *P. gigas* daily throughout the paramo above Mazan from 13 September 1987 (not 14th as stated in King 1989) until we left the area on 10 October. Observations had been made on the paramo from 30 July and the sudden appearance in numbers of *P. gigas* in mid September strongly suggested a migratory influx. A similar influx occurs in the north of the country in October (Ortiz-Crespo 1974).

Mazan *P. gigas* were recorded over an altitudinal range of 3450–3800 m, the paramo in this area extending between 3400 and 4000 m. This represents a substantial increase in the known altitudinal range of the species in Ecuador, Ortiz-Crespo (1974) giving a maximum altitude of 3300 m, with only 2 records over 3000 m. However, this extension is not unexpected, with *P. gigas* regularly occurring up to 4000 m in the Peruvian altiplano (Dorst 1956).

Upon the Mazan paramo, individual *P. gigas* established large (up to 2 ha) territories around stands of *Puya hamata* (Bromeliaceae) and these

were vigorously defended from all other species of hummingbirds as well as from conspecifics. Ortiz-Crespo (1974) found that *Agave americana* (Amaryllidaceae) was the predominant foodplant in Northern Ecuador, and he related patterns of *P. gigas* abundance to those of *Agave* flowering. *Agave* does not occur in the Mazan area (Fleming 1987), and throughout the period of observation *P. gigas* was seen to feed solely from the flowers of *Puya hamata*.

In 1986, despite regular coverage up to the end of September, no *P. gigas* had been recorded at Mazan. Interestingly, in 1987 botanical seasonality was advanced by an estimated 2 months compared to the previous year (V. Fleming), and it seems likely that the consequent earlier flowering of *P. hamata* resulted in earlier movement of *P. gigas* onto the Mazan paramo in this year.

Ortiz-Crespo (1974) suggested that *P. gigas* would not have been an ancient component of the Ecuadorian avifauna given its apparent close association with *Agave*, a plant not introduced into Ecuador until the early sixteenth century. However, our observations suggest a similar association with *Puya* in the south of the country. A nectar analysis of flower species utilised by Mazan hummingbirds (Dauris & King, unpubl. data) found *P. hamata* to average 1.86 ml of 15.5% sucrose per flower ($n=12$), and this compares with 2 ml of 16% sucrose/flower for *Agave* (Ortiz-Crespo 1974). In view of this similarity, and their physical size facilitating dominance over competitors, *P. gigas* may have found it easy to feed opportunistically on the newly planted *Agave* in sixteenth century Ecuador. Where *Agave* is now abundant, this hypothetical change in feeding pattern has resulted in a modern association between the 2 species which may be unrepresentative of the past; in the absence of *Agave*, *Puya* is clearly the preferred foodplant, as at Mazan (this study) and in Peru (Dorst 1956)—even in northern Ecuador, Ortiz-Crespo (1974) found 2 species of *Puya* (*P. aequatorialis* and *Puya* sp.) were the next most frequent foodplants after *Agave*.

Acknowledgements

We are very grateful to the Ministerio de Agricultura for permission to work in Ecuador. The botanical knowledge and comments of Messrs V. Fleming and J. Dauris improved these notes.

References:

- Dorst, J. 1956. Étude biologique des trochilides des hauts plateaux pérouviens. *L'Oiseau* 26: 165–193.
Fleming, V. 1987. Plants and Fungi, in F. Robinson (Ed.) *Rio Mazan Project 1986 Report*. Norwich: RMP.
King, J. R. 1989. Notes on the birds of the Rio Mazan Valley, Azuay Province, Ecuador, with special reference to *Leptosittaca branickii*, *Hapalopsittaca amazonina pyrrhops* and *Metallura baroni*. *Bull. Brit. Orn. Cl.* 109: 140–147.
Ministerio de Agricultura y Ganadería 1986. *Avifauna del Área de Recreación Cajas*. Cuenca: MAG.
Ortiz-Crespo, F. I. 1974. The Giant Hummingbird *Patagona gigas* in Ecuador. *Ibis* 116: 347–359.

Address: J. R. King and S. J. Holloway, Haresgrove Cottage, Hydon Heath, Godalming, Surrey GU8 4BB, U.K.